Cyber Tools for Large Collaborations

James D. Myers

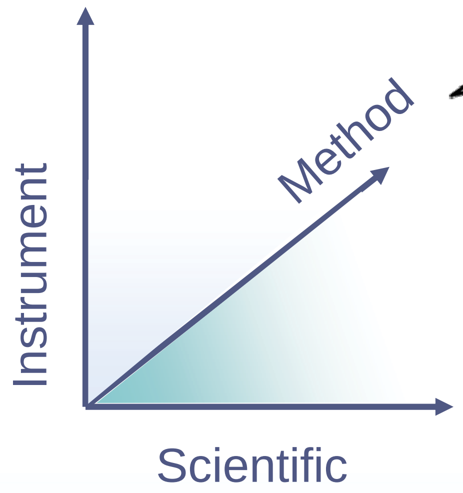
jimmyers@ncsa.uiuc.edu

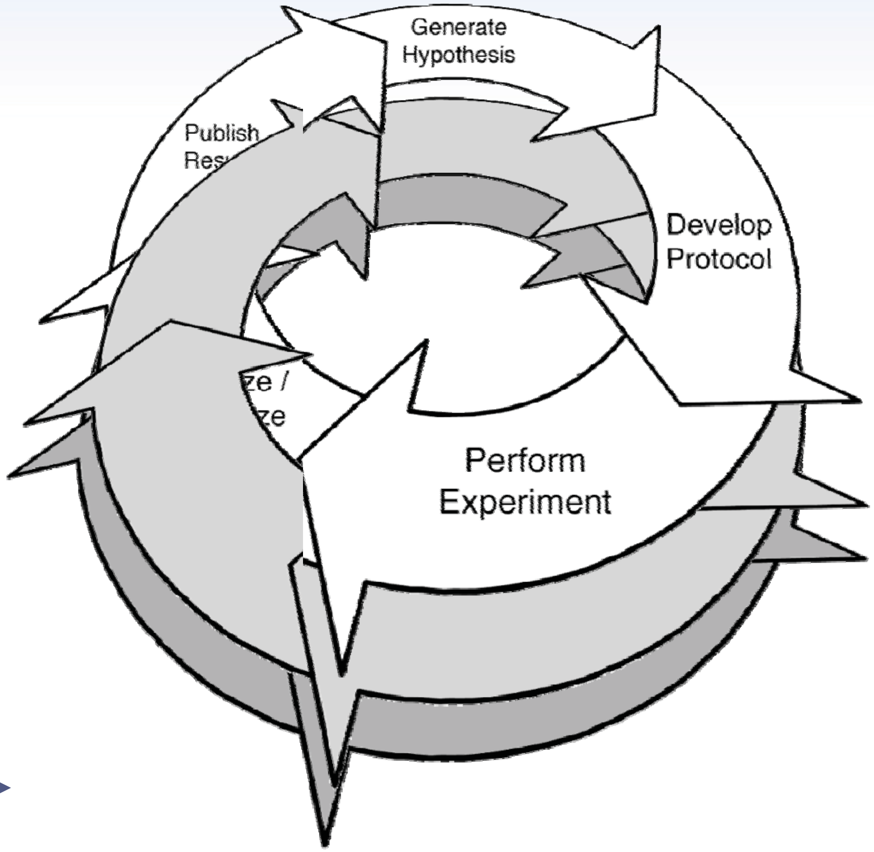
National Center for Supercomputing Applications
University of Illinois at Urbana-Champaign

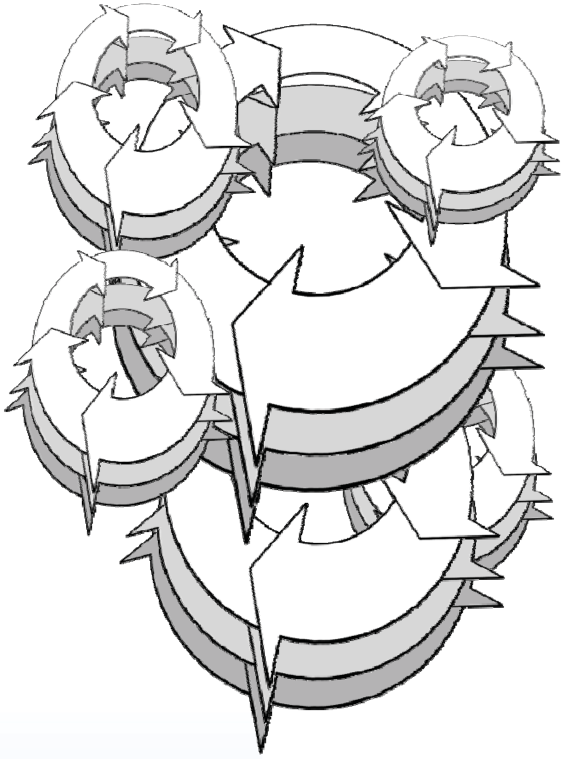
Outline

- What do we need Cyber Tools to do?
- What forms of Scalability do we need?
- Design ‘patterns’ for building scalable tools
- Some examples…

The Research Process





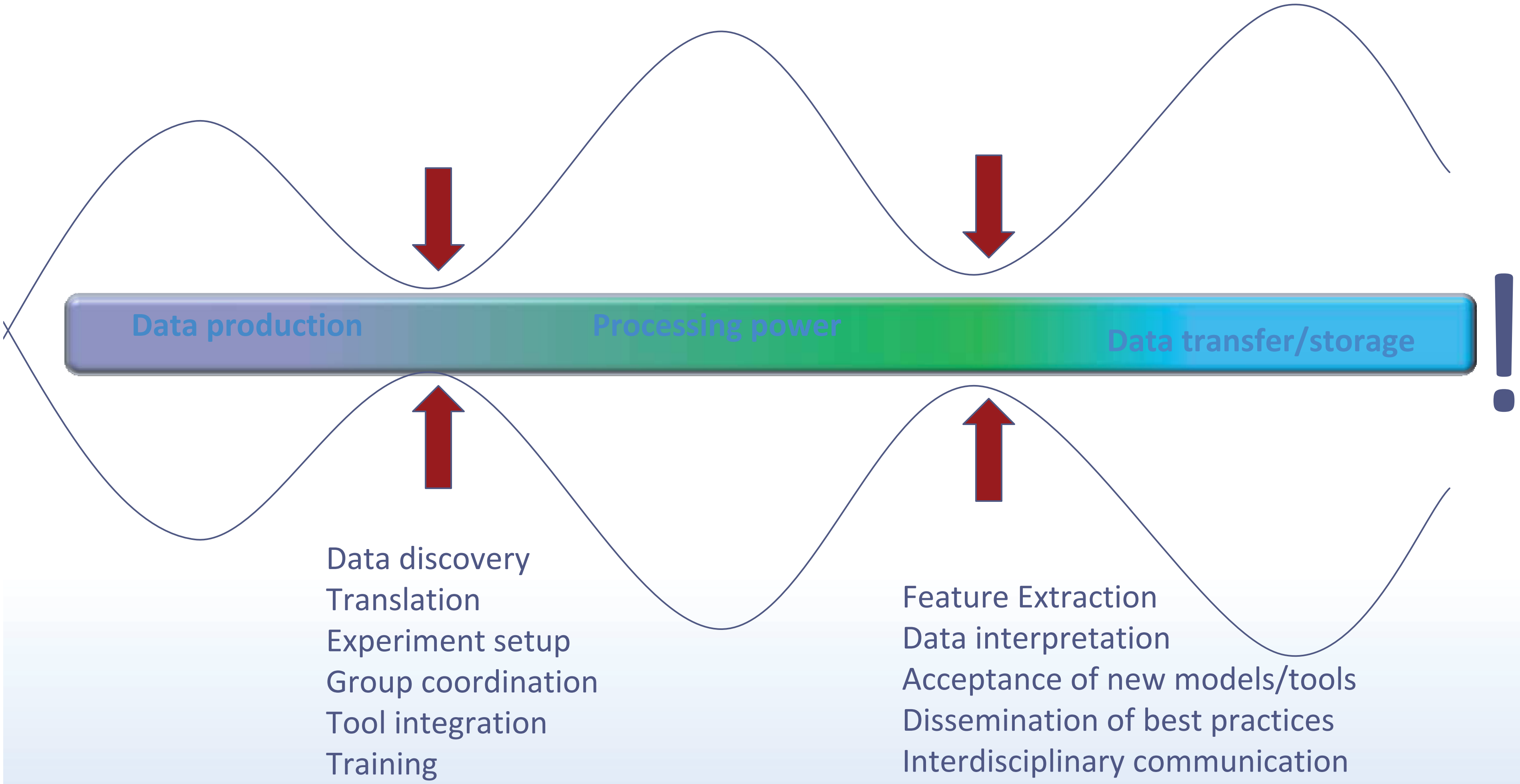


Multi-purpose use / Developing New Capabilities

The Core Project

Reference Data In Publications Out

Cyberenvironments Recognize ‘Amdahl’s Law’ for Scientific Progress



Data production

Processing power

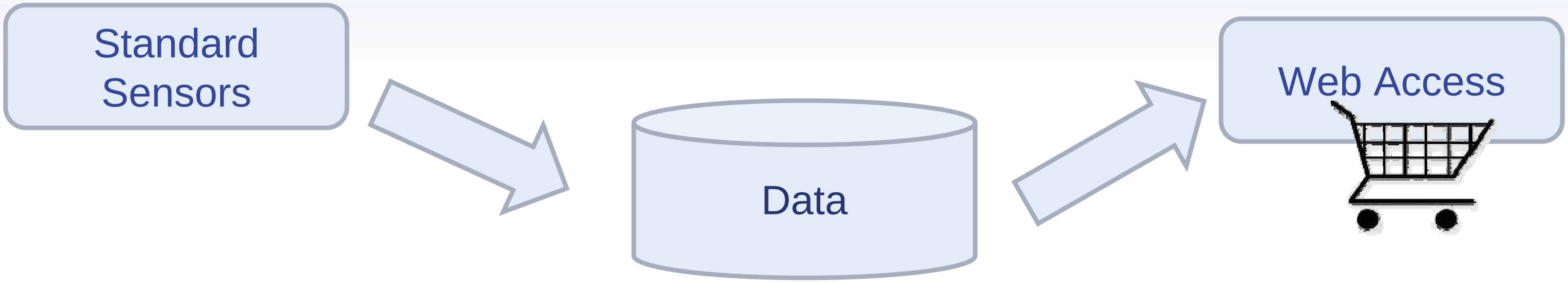
Data transfer/storage

!

Data discovery
Translation
Experiment setup
Group coordination
Tool integration
Training

Feature Extraction
Data interpretation
Acceptance of new models/tools
Dissemination of best practices
Interdisciplinary communication

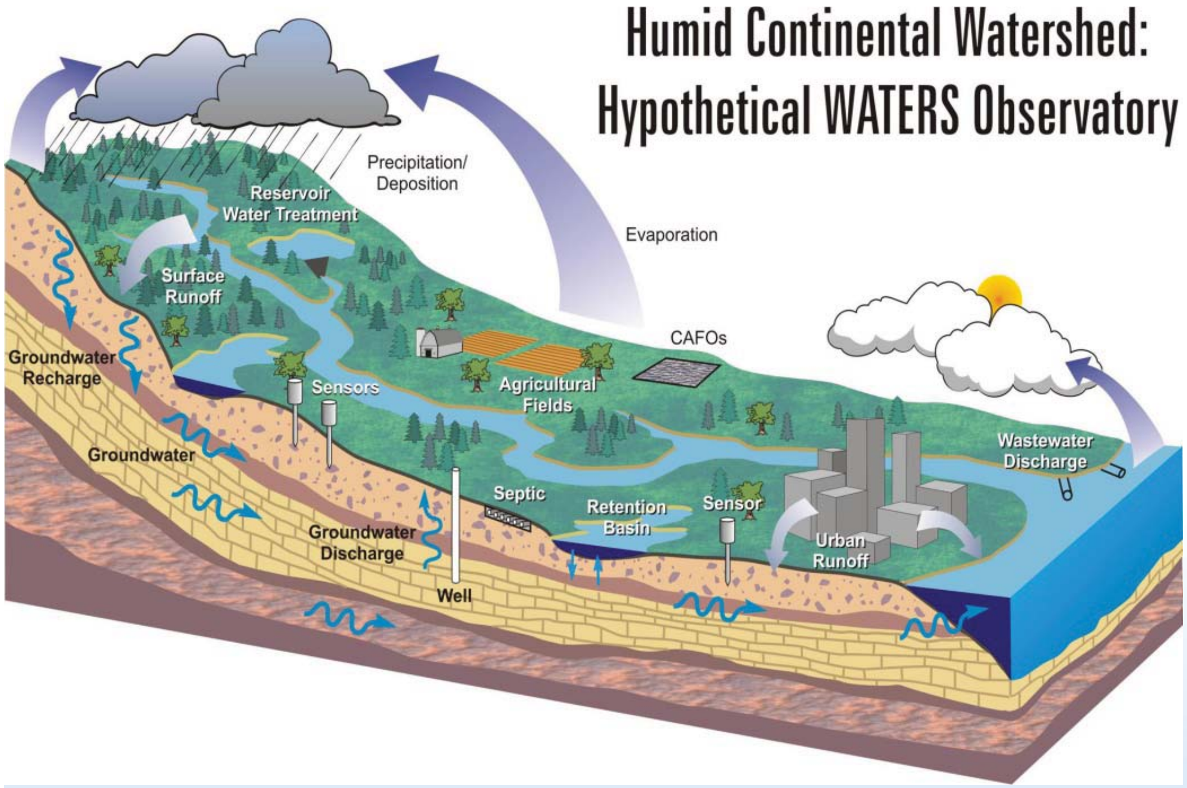
Environmental Observatories: Dissemination Model



Standard Sensors

Data

Web Access



Humid Continental Watershed: Hypothetical WATERS Observatory

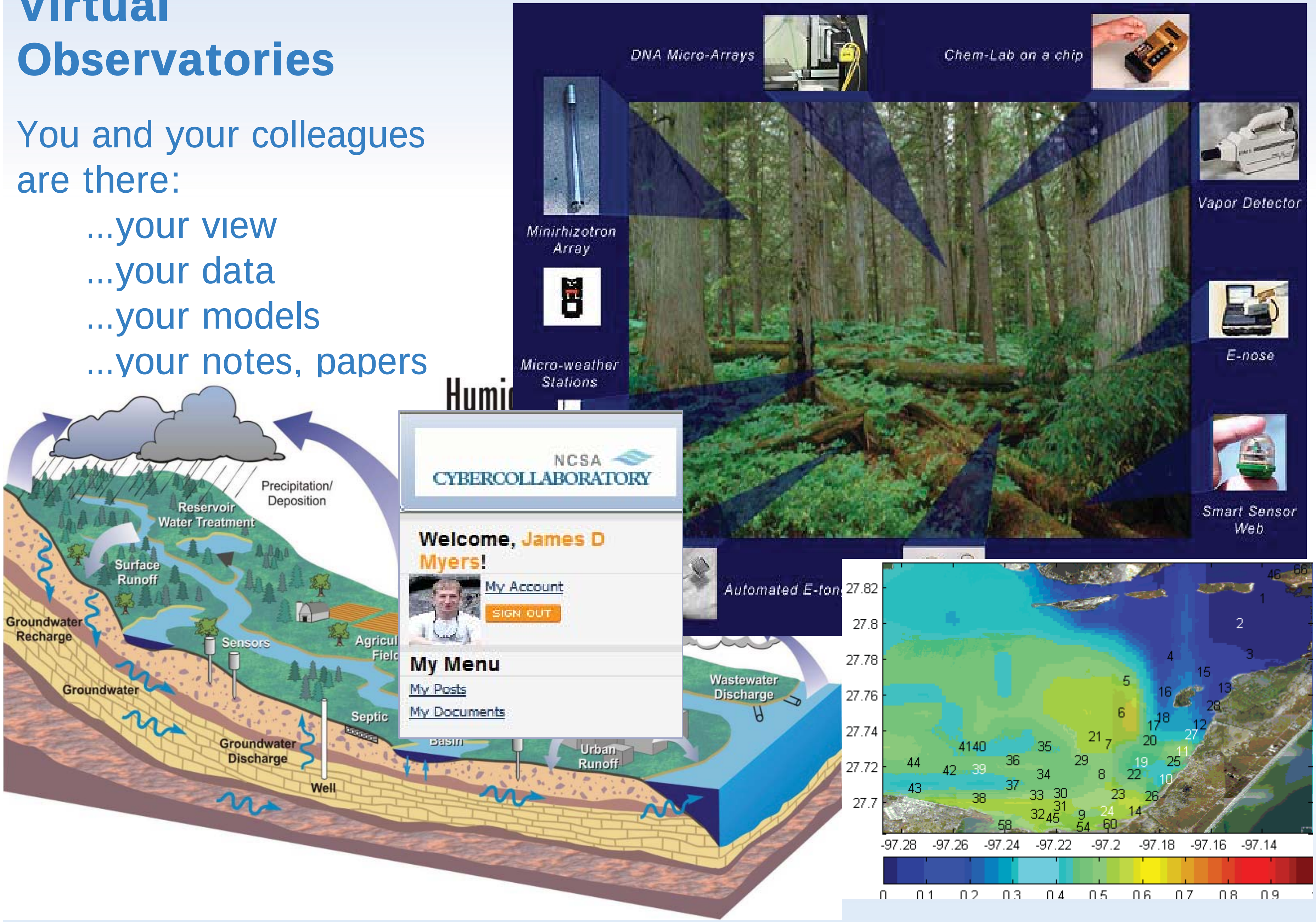
US NSF Observatories being planned:

Ocean Observatories Initiative (OOI)
National Ecological Observatory Network (NEON)
WATERS Network

Virtual Observatories

You and your colleagues are there:

...your view
...your data
...your models
...your notes, papers

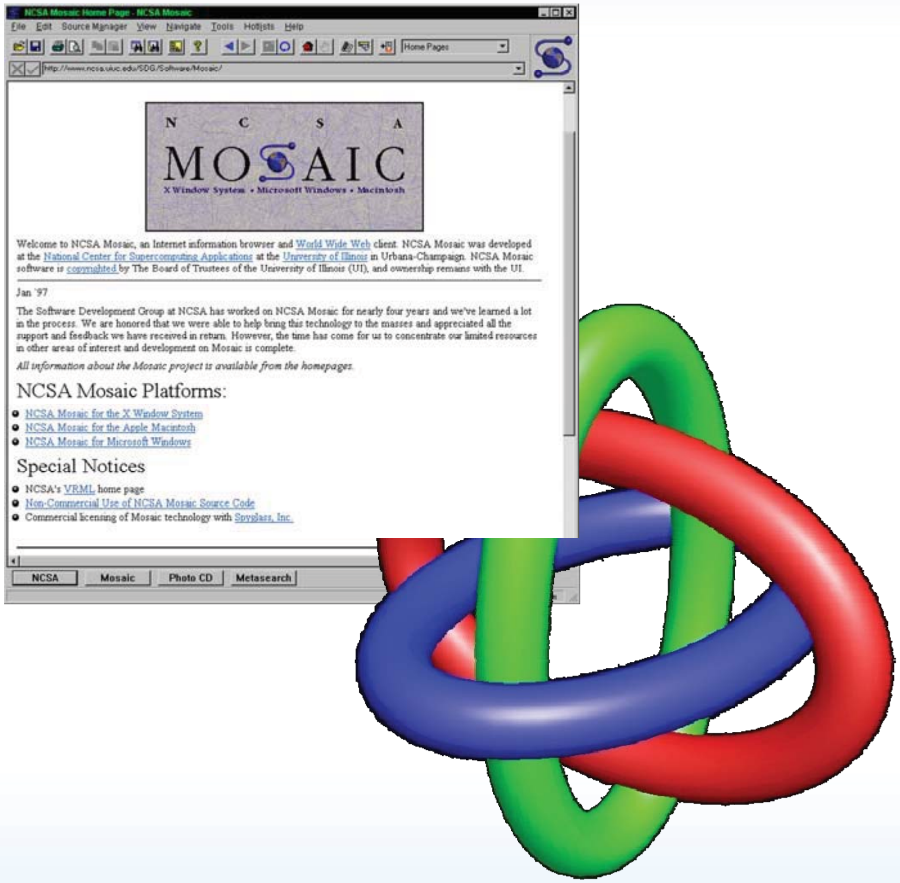


NCSA CYBERCOLLABORATORY

Welcome, James D Myers!

Is the World Wide Web a way to share web pages?

- Mosaic
  - By early 1990s, the internet had a wealth of resources, but they were inaccessible to most scientists
  - *Individual publishing*
  - *Browsing versus retrieving*
  - *See "Web 2.0 ... The Machine is Us/ing Us"*
- Cyberenvironments
  - By the early 2000's, the internet and grid had a wealth of interactive resources, but they were inaccessible to most scientists
  - *Individual information models*
  - *Fusion versus gathering*


NCSA Mosaic Home Page - NCSA Mosaic
File Edit Source Manager View Navigate Tools Hotlists Help
Home Pages
http://www.ncsa.uiuc.edu/SDG/Software/Mosaic/
N C S A
MOSAIC
X Window System • Microsoft Windows • Macintosh
NCSA
Mosaic
Photo CD
Metasearch

Welcome to NCSA Mosaic, an Internet information browser and World Wide Web client. NCSA Mosaic was developed at the National Center for Supercomputing Applications at the University of Illinois in Urbana-Champaign. NCSA Mosaic software is copyrighted by The Board of Trustees of the University of Illinois (UI), and ownership remains with the UI.

Jan '97

The Software Development Group at NCSA has worked on NCSA Mosaic for nearly four years and we've learned a lot in the process. We are honored that we were able to help bring this technology to the masses and appreciated all the support and feedback we have received in return. However, the time has come for us to concentrate our limited resources in other areas of interest and development on Mosaic is complete.

All information about the Mosaic project is available from the homepages.

NCSA Mosaic Platforms:

- NCSA Mosaic for the X Window System
- NCSA Mosaic for the Apple Macintosh
- NCSA Mosaic for Microsoft Windows

Special Notices

- NCSA's VRML home page
- Non-Commercial Use of NCSA Mosaic Source Code
- Commercial licensing of Mosaic technology with Spyglass, Inc.

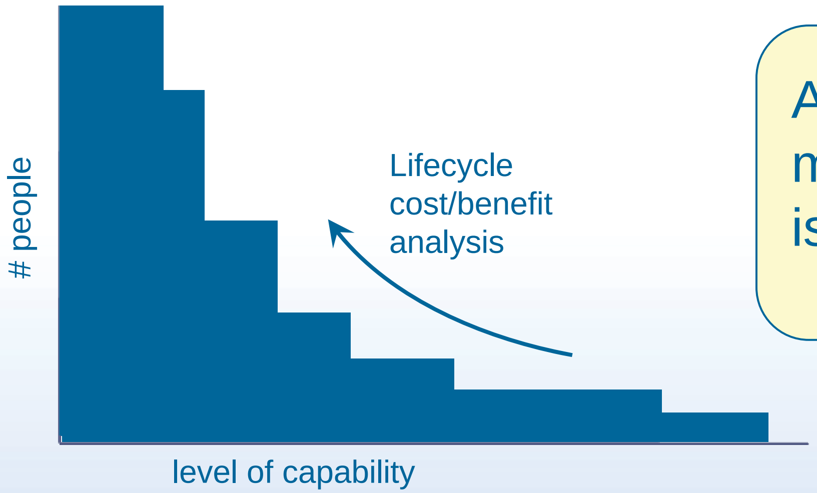
See "The Machine is Us/ing Us"! Michael Wesch

Beyond Data ‘Take-Out’:

- **Enable synthesis of multiple types of data?**
- **Provide useful statistical and visual summaries?**
- **Combine observational and modeled data?**
- **Integrate derived products from within and across large heterogeneous edge-less communities?**
- Capture processes for reuse?
- Convey expertise as well as raw resources?
- Enable individuals to create derived data and capabilities that are ‘first class citizens’?
- Support rapid dissemination and evolution of preliminary results?
- Enable problem-focused Collaboration?
- Support long-term curation and preservation by third parties?

Can we build it?

- There are certainly research issues in providing such rich capabilities cost-effectively…
- Can we architect to allow ‘innovation at the edges’
  - What do we need to standardize?
  - What do we need to decouple?



Architecting and managing for CI that is “grown, not built”*

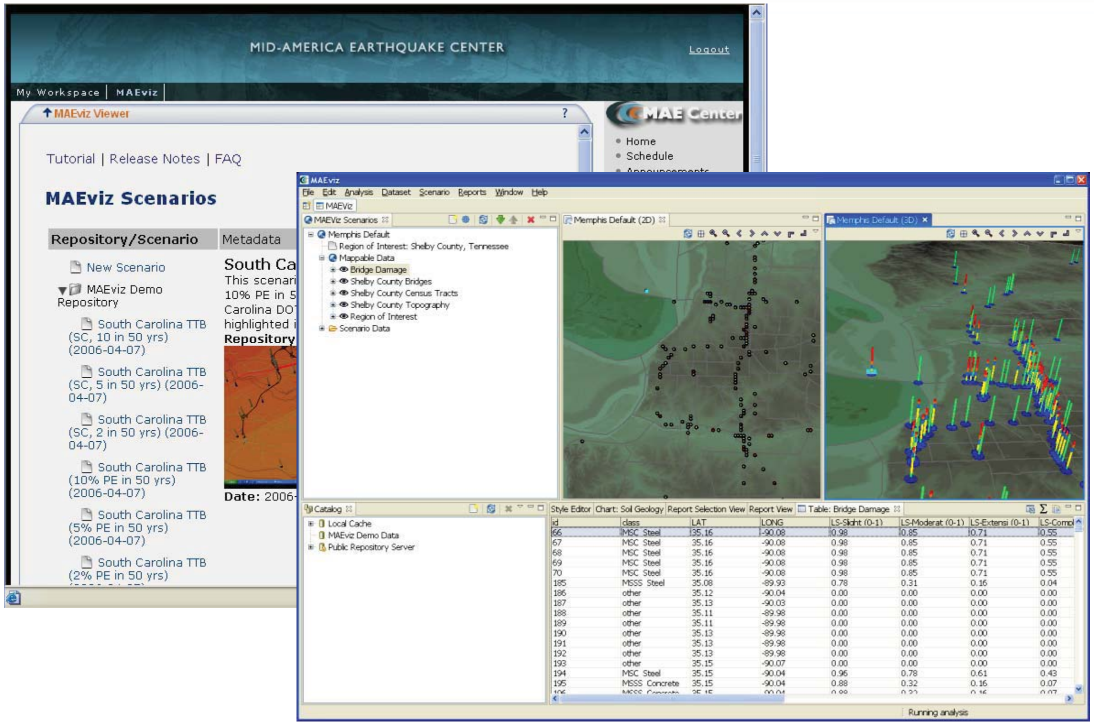
*Ixchel Faniel, U. Michigan

Relevant Design Patterns for Scalable Not Scaled Cyber Tools

- Abstract interfaces that separate how from what:
    - Authentication ala JAAS, PAM (via callbacks)
    - Content management (via metadata/typed blob abstraction)
    - Global identifiers and declarative semantics (via semantic web)
    - Process abstraction (via workflow and provenance services)
    - Interface integration (via plug-ins, widget, portlets, mash-ups)
    - Event integration (e.g. via enterprise service bus)
    - Virtualization (e.g. services, virtual machines, Grid)

- Standardization occurs via social processes rather than technology lock-in – think TCP-IP, HTTP, XML
- Community-centric projects can help standardize and coordinate (e.g. FEON, Provenance Challenge)

MAEViz: Consequence-Based Risk Management for Seismic Events



Tutorial | Release Notes | FAQ

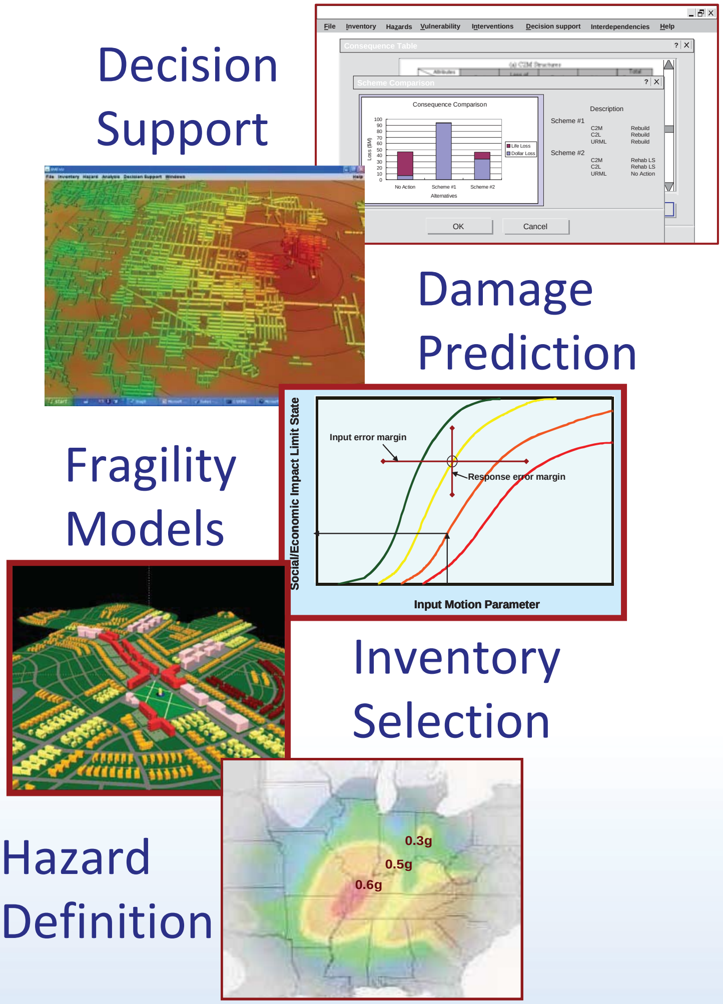
MAEviz Scenarios

Repository/Scenario	Metadata
New Scenario MAEviz Demo Repository South Carolina TTB (SC, 10 in 50 yrs) (2006-04-07) South Carolina TTB (SC, 5 in 50 yrs) (2006-04-07) South Carolina TTB (SC, 2 in 50 yrs) (2006-04-07) South Carolina TTB (10% PE in 50 yrs) (2006-04-07) South Carolina TTB (5% PE in 50 yrs) (2006-04-07) South Carolina TTB (2% PE in 50 yrs)	**South Ca** This scenari 10% PE in 5 Carolina DO highlighted i **Repository** **Date:** 2006-

- Memphis Default
  - Region of Interest: Shelby County, Tennessee
  - Mappable Data
    - Bridge Damage
    - Shelby County Bridges
    - Shelby County Census Tracts
    - Shelby County Topography
    - Region of Interest
  - Scenario Data

- Local Cache
- MAEviz Demo Data
- Public Repository Server

id	class	LAT	LONG	LS-Slight (0-1)	LS-Moderat (0-1)	LS-Extensi (0-1)	LS-Compl
66	MSC Steel	35.16	-90.08	0.98	0.85	0.71	0.55
67	MSC Steel	35.16	-90.08	0.98	0.85	0.71	0.55
68	MSC Steel	35.16	-90.08	0.98	0.85	0.71	0.55
69	MSC Steel	35.16	-90.08	0.98	0.85	0.71	0.55
70	MSC Steel	35.16	-90.08	0.98	0.85	0.71	0.55
185	MSSS Steel	35.08	-89.93	0.78	0.31	0.16	0.04
186	other	35.12	-90.04	0.00	0.00	0.00	0.00
187	other	35.13	-90.03	0.00	0.00	0.00	0.00
188	other	35.11	-89.98	0.00	0.00	0.00	0.00
189	other	35.11	-89.98	0.00	0.00	0.00	0.00
190	other	35.13	-89.98	0.00	0.00	0.00	0.00
191	other	35.13	-89.98	0.00	0.00	0.00	0.00
192	other	35.13	-89.98	0.00	0.00	0.00	0.00
193	other	35.15	-90.07	0.00	0.00	0.00	0.00
194	MSC Steel	35.15	-90.04	0.96	0.78	0.61	0.43
195	MSSS Concrete	35.15	-90.04	0.88	0.32	0.16	0.07



Decision Support

Damage Prediction

Fragility Models

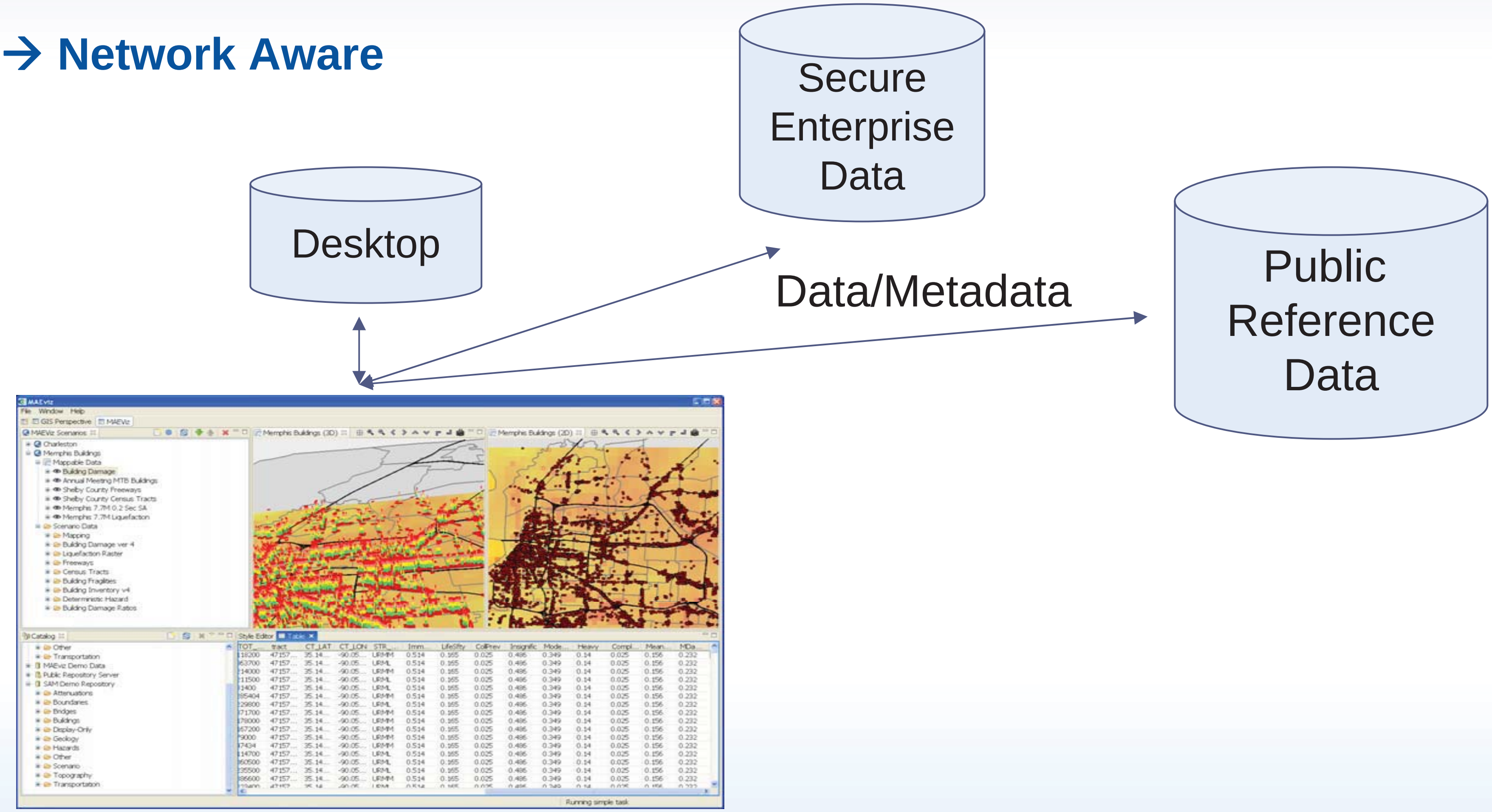
Inventory Selection

Hazard Definition

- **Engineering View of MAE Center Research**
- **Physical through Socio-economic Analysis**
- **A “Cyberinfrastructure Aware” Application**

“I have sensitive data I won’t distribute”

→ Network Aware



TOT_...	tract	CT_LAT	CT_LON	STR_...	Imm	LifeSfty	CollPrev	Insignific	Mode...	Heavy	Compl...	Mean	MDa
118200	47157...	35.14...	-90.05...	URMM	0.514	0.165	0.025	0.486	0.349	0.14	0.025	0.156	0.232
63700	47157...	35.14...	-90.05...	URML	0.514	0.165	0.025	0.486	0.349	0.14	0.025	0.156	0.232
14000	47157...	35.14...	-90.05...	URMM	0.514	0.165	0.025	0.486	0.349	0.14	0.025	0.156	0.232
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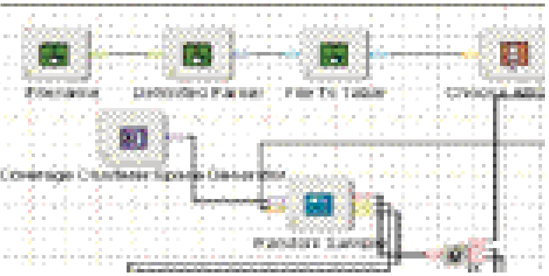
29800	47157...	35.14...	-90.05...	URML	0.514	0.165	0.025	0.486	0.349	0.14	0.025	0.156	0.232
71700	47157...	35.14...	-90.05...	URMM	0.514	0.165	0.025	0.486	0.349	0.14	0.025	0.156	0.232
78000	47157...	35.14...	-90.05...	URMM	0.514	0.165	0.025	0.486	0.349	0.14	0.025	0.156	0.232
67200	47157...	35.14...	-90.05...	URMM	0.514	0.165	0.025	0.486	0.349	0.14	0.025	0.156	0.232
9000	47157...	35.14...	-90.05...	URMM	0.514	0.165	0.025	0.486	0.349	0.14	0.025	0.156	0.232
7434	47157...	35.14...	-90.05...	URMM	0.514	0.165	0.025	0.486	0.349	0.14	0.025	0.156	0.232
114700	47157...	35.14...	-90.05...	URML	0.514	0.165	0.025	0.486	0.349	0.14	0.025	0.156	0.232
60500	47157...	35.14...	-90.05...	URML	0.514	0.165	0.025	0.486	0.349	0.14	0.025	0.156	0.232
35500	47157...	35.14...	-90.05...	URML	0.514	0.165	0.025	0.486	0.349	0.14	0.025	0.156	0.232
86600	47157...	35.14...	-90.05...	URMM	0.514	0.165	0.025	0.486	0.349	0.14	0.025	0.156	0.232

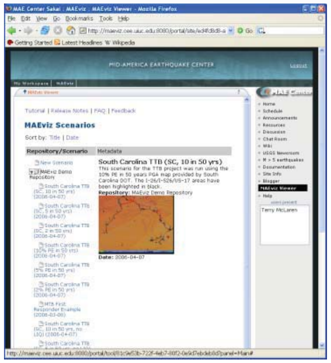
- WebDAV, JCR, RDF, SAM, Tupelo

“Understanding the Scientific Basis of Decisions is Critical”
“My calculations are getting too large for my desktop”

→ Process Aware



Process Capture


MAE Center Sakai : MAEviz : MAEviz Viewer - Mozilla Firefox
File Edit View Go Bookmarks Tools Help
http://maeviz.cee.uiuc.edu:8080/portal/site/ed4fd8d8-a
Getting Started Latest Headlines Wikipedia
MID-AMERICA EARTHQUAKE CENTER
Logout
My Workspace
MAEviz
MAEviz Viewer
Tutorial | Release Notes | FAQ | Feedback
Home
Schedule
Announcements
Resources
Discussion
Chat Room
Wiki
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M > 5 earthquakes
Documentation
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Blogger
MAEviz Viewer
Help

MAEviz Scenarios

Sort by: Title | Date

Repository/Scenario	Metadata
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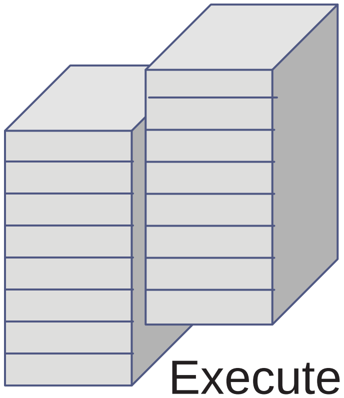
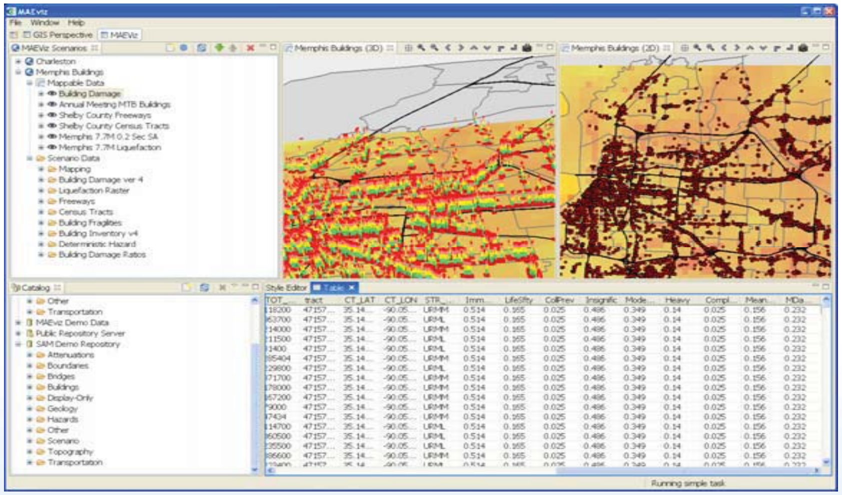
Terry McLaren

http://maeviz.cee.uiuc.edu:8080/portal/tool/81c9e53b-722f-4eb7-80f2-0e9d7ebdeb0d?panel=Main#

Discover



Execute



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178000	47157...	35.14...	-90.05...	URMM	0.514	0.165	0.025	0.486	0.349	0.14	0.025	0.156	0.232
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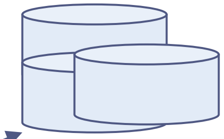
86600	47157...	35.14...	-90.05...	URMM	0.514	0.165	0.025	0.486	0.349	0.14	0.025	0.156	0.232
[illegible]	47157...	35.14...	-90.05...	URML	0.514	0.165	0.025	0.486	0.349	0.14	0.025	0.156	0.232

articles

Impact of a New Madrid Event

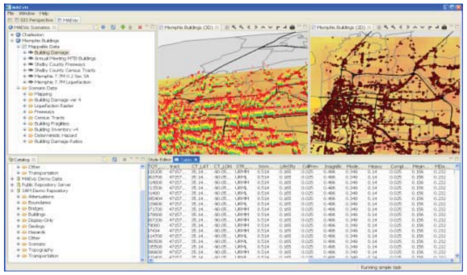


Report

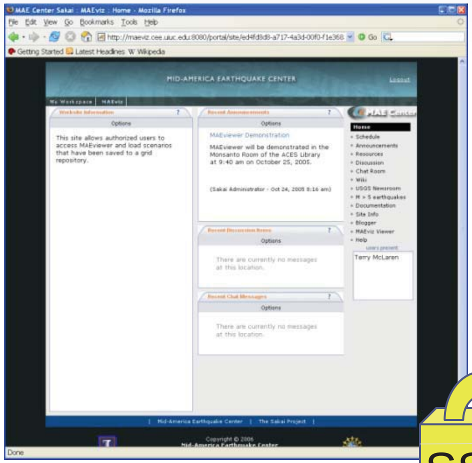
- Workflow, Provenance, OPM, RDF

“Developing a Scenario requires a wide range of expertise”

→ Group Aware



Plan, Coordinate, Share, Compare



MAE Center Sakai : MAEviz : Home - Mozilla Firefox

http://maeviz.cee.uiuc.edu:8080/portal/site/ed4fd8d8-a717-4a3d-00f0-f1e368

MID-AMERICA EARTHQUAKE CENTER

Website Information

This site allows authorized users to access MAEviewer and load scenarios that have been saved to a grid repository.

Recent Announcements

MAEviewer Demonstration

MAEviewer will be demonstrated in the Monsanto Room of the ACES Library at 9:40 am on October 25, 2005.

(Sakai Administrator - Oct 24, 2005 8:16 am)

Recent Discussion Items

There are currently no messages at this location.

Recent Chat Messages

There are currently no messages at this location.

Home
- Schedule
- Announcements
- Resources
- Discussion
- Chat Room
- Wiki
- USGS Newsroom
- M > 5 earthquakes
- Documentation
- Site Info
- Blogger
- MAEviz Viewer
- Help

users present:
Terry McLaren

| Mid-America Earthquake Center | The Sakai Project |

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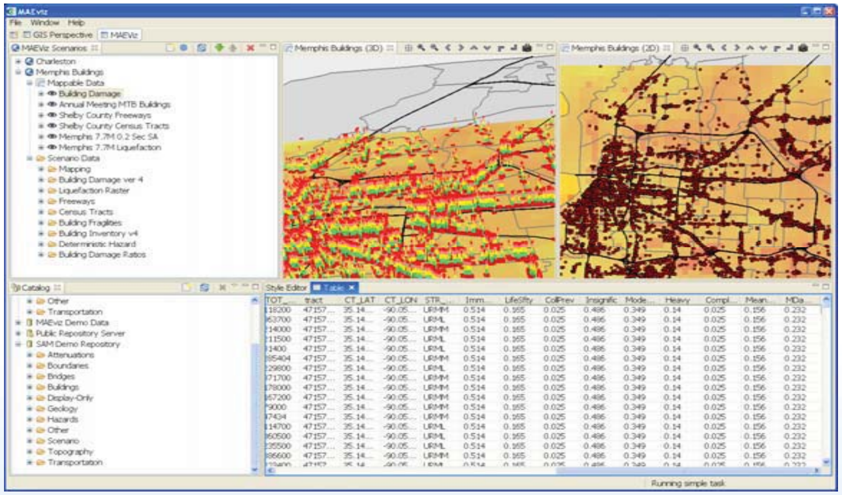
Mid-America Earthquake Center

SSO



MAEviz

MAEviz Scenarios
- Charleston
- Memphis Buildings
  - Mappable Data
    - Building Damage
    - Annual Meeting MTB Buildings
    - Shelby County Freeways
    - Shelby County Census Tracts
    - Memphis 7.7M 0.2 Sec SA
    - Memphis 7.7M Liquefaction
  - Scenario Data
    - Mapping
    - Building Damage ver 4
    - Liquefaction Raster
    - Freeways
    - Census Tracts
    - Building Fragilities
    - Building Inventory v4
    - Deterministic Hazard
    - Building Damage Ratios

Catalog
- Other
- Transportation
- MAEviz Demo Data
- Public Repository Server
- SAM Demo Repository
  - Attenuations
  - Boundaries
  - Bridges
  - Buildings
  - Display-Only
  - Geology
  - Hazards
  - Other
  - Scenario
  - Topography
  - Transportation

TOT_...	tract	CT_LAT	CT_LON	STR_...	Imm...	LifeSfty	CollPrev	Insignific	Mode...	Heavy	Compl...	Mean...	MDa...
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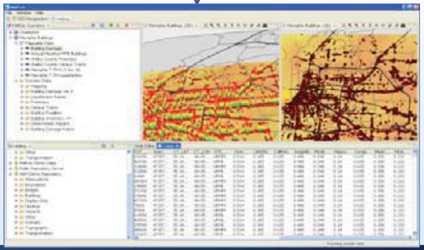
229800	47157...	35.14...	-90.05...	URML	0.514	0.165	0.025	0.486	0.349	0.14	0.025	0.156	0.232
71700	47157...	35.14...	-90.05...	URMM	0.514	0.165	0.025	0.486	0.349	0.14	0.025	0.156	0.232
178000	47157...	35.14...	-90.05...	URMM	0.514	0.165	0.025	0.486	0.349	0.14	0.025	0.156	0.232
167200	47157...	35.14...	-90.05...	URMM	0.514	0.165	0.025	0.486	0.349	0.14	0.025	0.156	0.232
79000	47157...	35.14...	-90.05...	URMM	0.514	0.165	0.025	0.486	0.349	0.14	0.025	0.156	0.232
17434	47157...	35.14...	-90.05...	URMM	0.514	0.165	0.025	0.486	0.349	0.14	0.025	0.156	0.232
114700	47157...	35.14...	-90.05...	URML	0.514	0.165	0.025	0.486	0.349	0.14	0.025	0.156	0.232
160500	47157...	35.14...	-90.05...	URML	0.514	0.165	0.025	0.486	0.349	0.14	0.025	0.156	0.232
235500	47157...	35.14...	-90.05...	URML	0.514	0.165	0.025	0.486	0.349	0.14	0.025	0.156	0.232
186600	47157...	35.14...	-90.05...	URMM	0.514	0.165	0.025	0.486	0.349	0.14	0.025	0.156	0.232

Running simple task

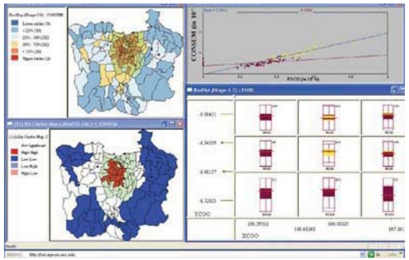
Wiki
Task List
Chat
Document Repository
Scenario Repository
Training Materials

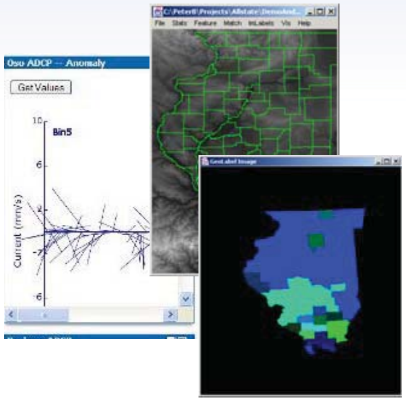


- Collaboratory, Portal, …

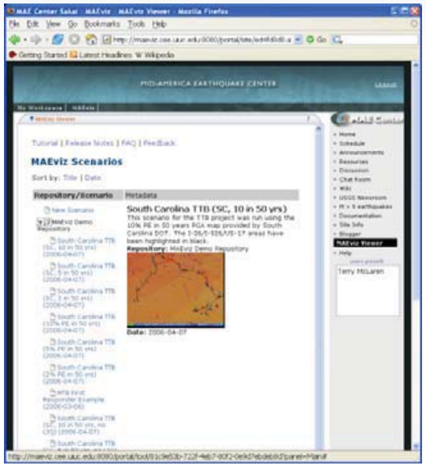
“My results could impact how we prepare for the next event”

→ Dynamic





New Third-Party Analyses


MAE Center Sakai : MAEviz : MAEviz Viewer - Mozilla Firefox
File Edit View Go Bookmarks Tools Help
Getting Started Latest Headlines W Wikipedia
MID-AMERICA EARTHQUAKE CENTER
Tutorial | Release Notes | FAQ | Feedback
Home
Schedule
Announcements
Resources
Discussion
Chat Room
Wiki
USGS Newsroom
Documentation
Site Info
Blogger
MAEviz Viewer
Help
Terry McLaren

MAEviz Scenarios

Sort by: Title | Date

Repository/Scenario | Metadata

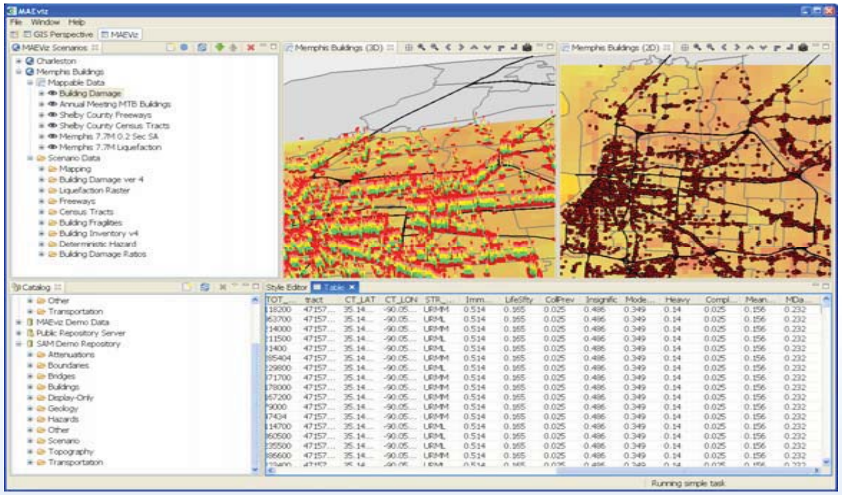
South Carolina TTB (SC, 10 in 50 yrs)

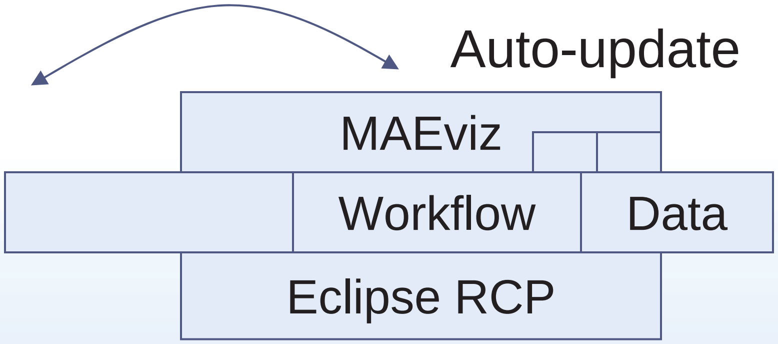
This scenario for the TTB project was run using the 10% PE in 50 years PGA map provided by South Carolina DOT. The I-26/I-526/US-17 areas have been highlighted in black.

Repository: MAEviz Demo Repository

Date: 2006-04-07

Compare, Contrast, Validate



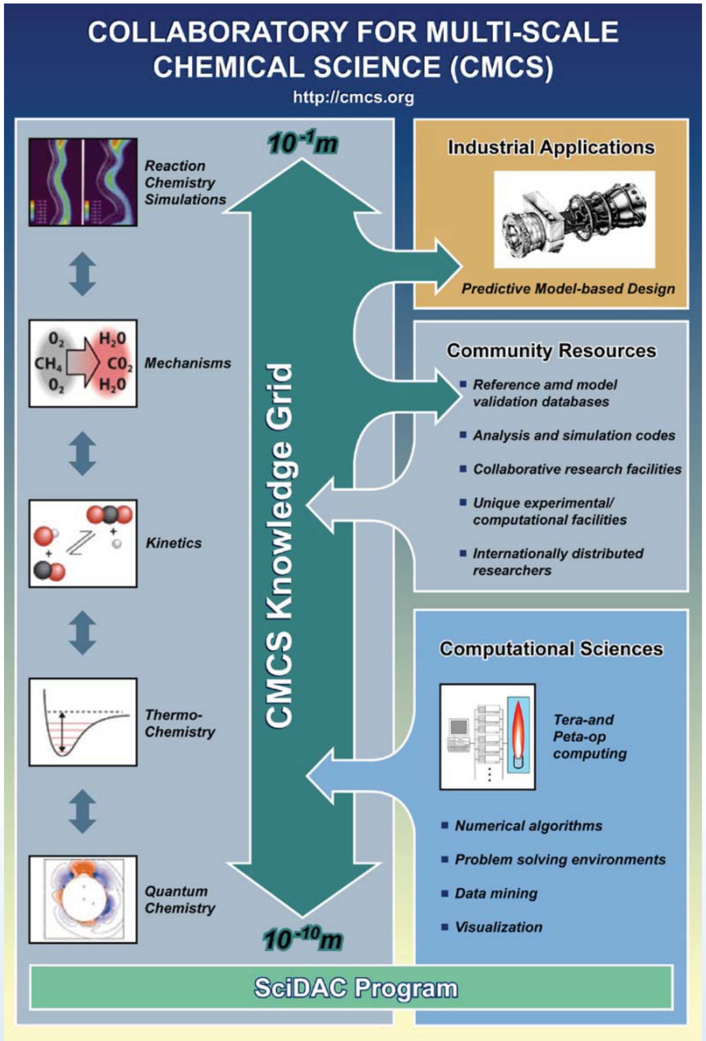


- Plug-ins, Provenance, Environment

Plug-in Framework

Collaboratory for Multiscale Chemical Science (http://cmcs.org)

- **A systems-science approach to addressing complex problems**
  - **New knowledge is assimilated from different data, tools, and disciplines at each scale**
  - **Real-time bi-directional information flow**
  - **Multiple applications of the same information**
  - **Evolving scientific models and tools**
- **A cyberenvironment approach:**
  - **General content store with configurable translations**
  - **Publish/subscribe messaging**
  - **Portal, application, and service interfaces**
  - **Multiscale provenance**
  - **+ Standard data/tool/collaboration access**
  - **Community/group coordination, data curation, and model validation**



COLLABORATORY FOR MULTI-SCALE CHEMICAL SCIENCE (CMCS)

http://cmcs.org

10^{-1}m

CMCS Knowledge Grid

10^{-10}m

Reaction Chemistry Simulations

Mechanisms

Kinetics

Thermo-Chemistry

Quantum Chemistry

Industrial Applications

Predictive Model-based Design

Community Resources

- *Reference amd model validation databases*
- *Analysis and simulation codes*
- *Collaborative research facilities*
- *Unique experimental/ computational facilities*
- *Internationally distributed researchers*

Computational Sciences

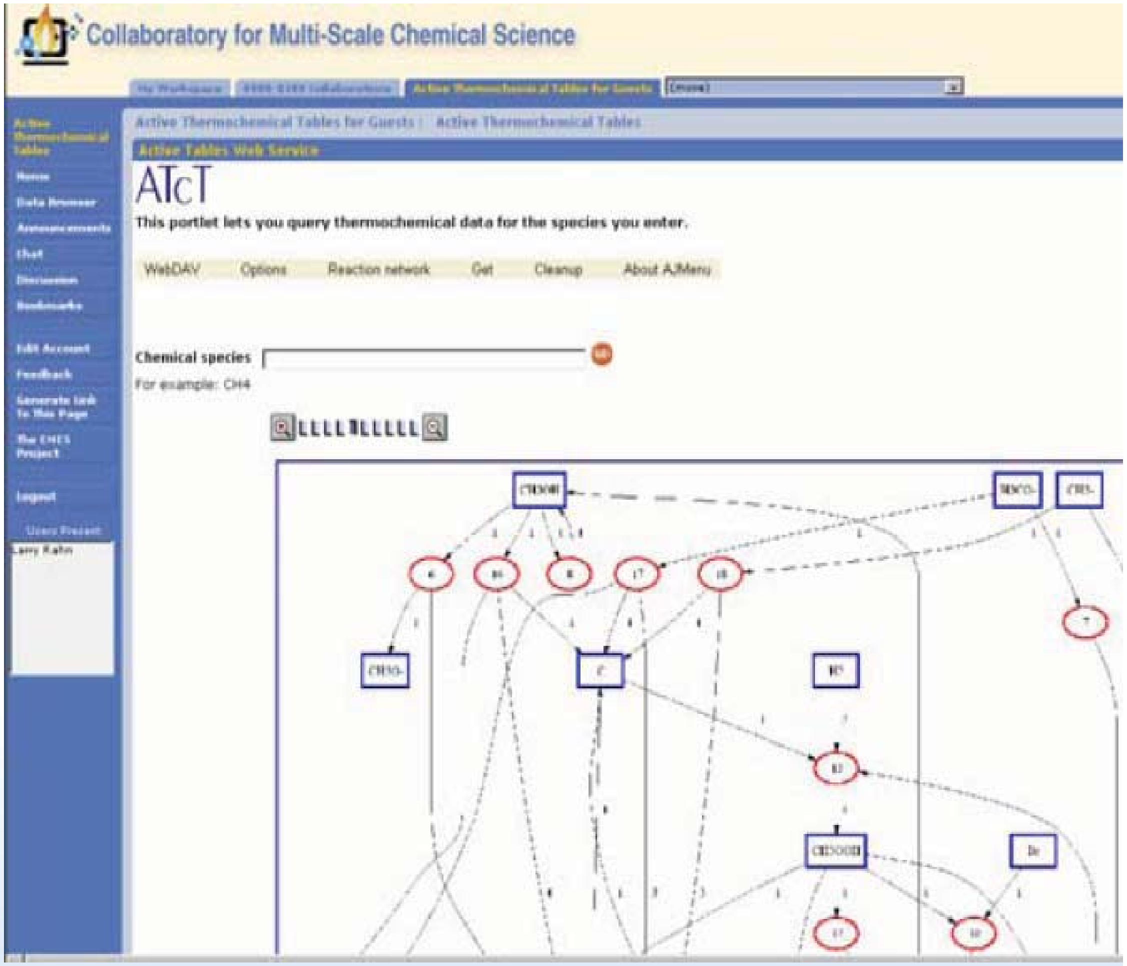
Tera-and Peta-op computing

- *Numerical algorithms*
- *Problem solving environments*
- *Data mining*
- *Visualization*

SciDAC Program

Active ThermoChemical Tables (Ruscic)

- Statistical Analysis of Thermochemical Networks
- Inconsistent inputs
- Simultaneous analysis of uncertainties across network
- ‘What If’ Analysis
- Potential to Trigger New Calculations



Collaboratory for Multi-Scale Chemical Science

Active Thermochemical Tables for Guests : Active Thermochemical Tables

Active Tables Web Service

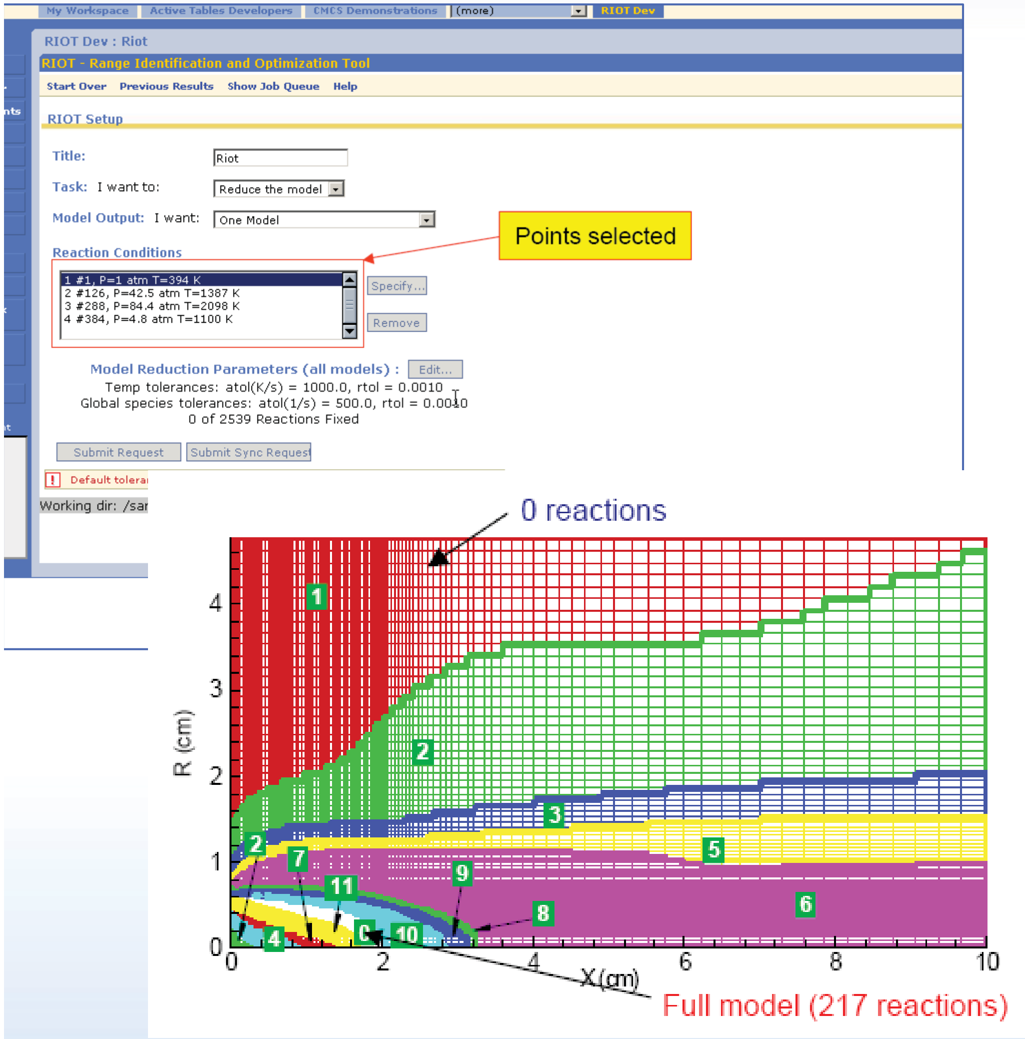
ATcT

This portlet lets you query thermochemical data for the species you enter.

Chemical species

For example: CH4

“Range Identification & Optimization Tool” for Mechanism Reduction (Green)



RIOT Dev : Riot

RIOT - Range Identification and Optimization Tool

RIOT Setup

Title: Riot

Task: I want to: Reduce the model

Model Output: I want: One Model

Reaction Conditions

1 #1, P=1 atm T=394 K
2 #126, P=42.5 atm T=1387 K
3 #288, P=84.4 atm T=2098 K
4 #384, P=4.8 atm T=1100 K

Points selected

Model Reduction Parameters (all models) :

Temp tolerances: atol(K/s) = 1000.0, rtol = 0.0010
Global species tolerances: atol(1/s) = 500.0, rtol = 0.0010
0 of 2539 Reactions Fixed

! Default tolera

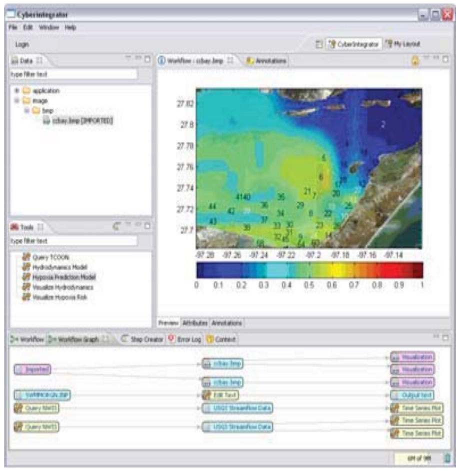
Working dir: /sar

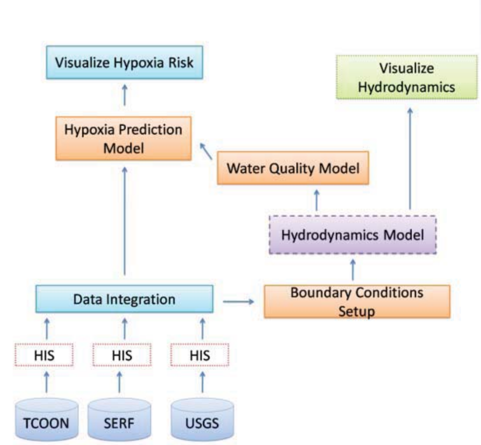
0 reactions

Full model (217 reactions)

- Mechanism Reduction with Guaranteed Range of Validity
- Web Service @ MIT
- Portlet interface within CMCS
- Seamless data transfer
- Asynchronous operation

NCSA’s Digital Synthesis Framework (DSF)





Visualize Hypoxia Risk

Visualize Hydrodynamics

Hypoxia Prediction Model

Water Quality Model

Hydrodynamics Model

Data Integration

Boundary Conditions Setup

HIS

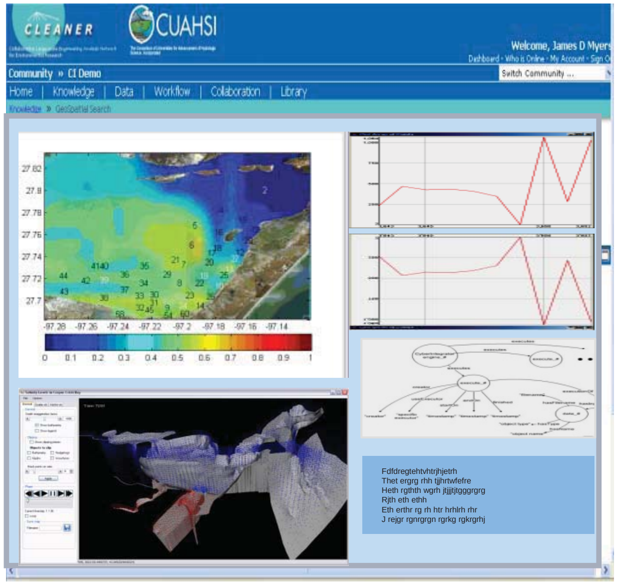
HIS

HIS

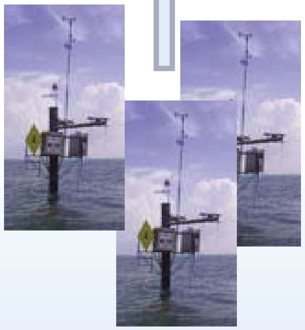
TCOON

SERF

USGS


CLEANER
CUAHSI
Welcome, James D Myers
Dashboard · Who is Online · My Account · Sign Out
Switch Community ...
Community » CI Demo
Home | Knowledge | Data | Workflow | Collaboration | Library
Knowledge » GeoSpatial Search

Fdfdregtehtvhtrjhjetrh
Thet ergrg rhh tjjhrtwfefre
Heth rgthth wgrh jtjjjtjtgggrgrg
Rjth eth ethh
Eth erthr rg rh htr hrhlrh rhr
J rejgr rgnrgrgn rgrkg rgkrgrhj



Historical Data

Create
Publish
Explore

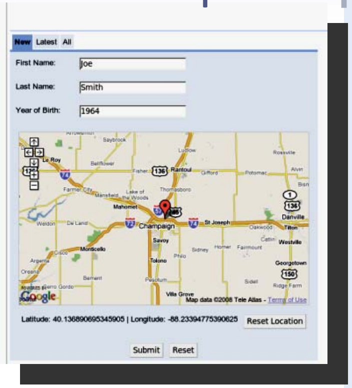
How does agriculture in the Midwest contribute to fish kills in the Gulf of Mexico?

Where should we send students today to make additional observations?

What are the multi-year trends in hypoxia?

Core DSF Concept

Web Inputs



First Name: Joe

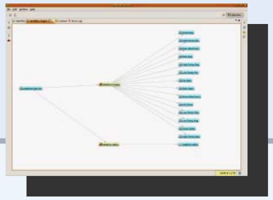
Last Name: Smith

Year of Birth: 1964

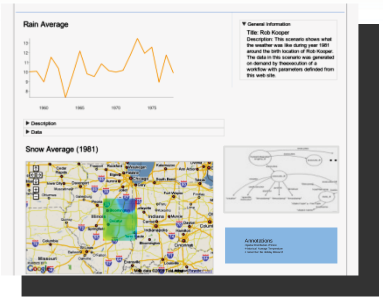
Map data ©2008 Tele Atlas - Terms of Use

Latitude: 40.136890695345905 | Longitude: -88.23394775390625

Workflow Execution Service



Visualized Outputs



General Information

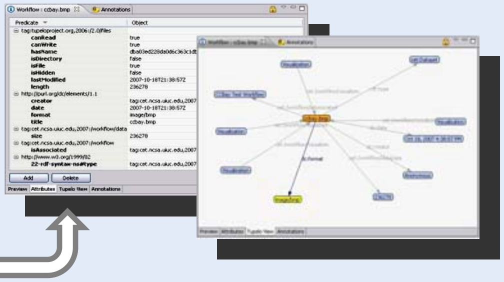
Title: Rob Kooper

Description: This scenario shows what the weather was like during year 1981 around the birth location of Rob Kooper. The data in this scenario was generated on demand by theexecution of a workflow with parameters definded from this web site.

Annotations
- Spatial Distribution of Snow
- Historical Average Temperature
- I remember the Holiday Blizzard!

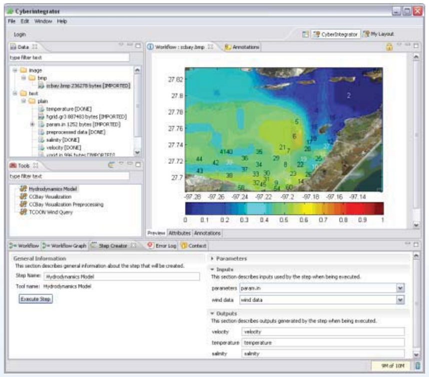
Publish

- Parameters
- Input Streams
- Trigger Conditions
- Visualization
- Provenance and Annotation Options



Semantic Content Repository & Provenance Store

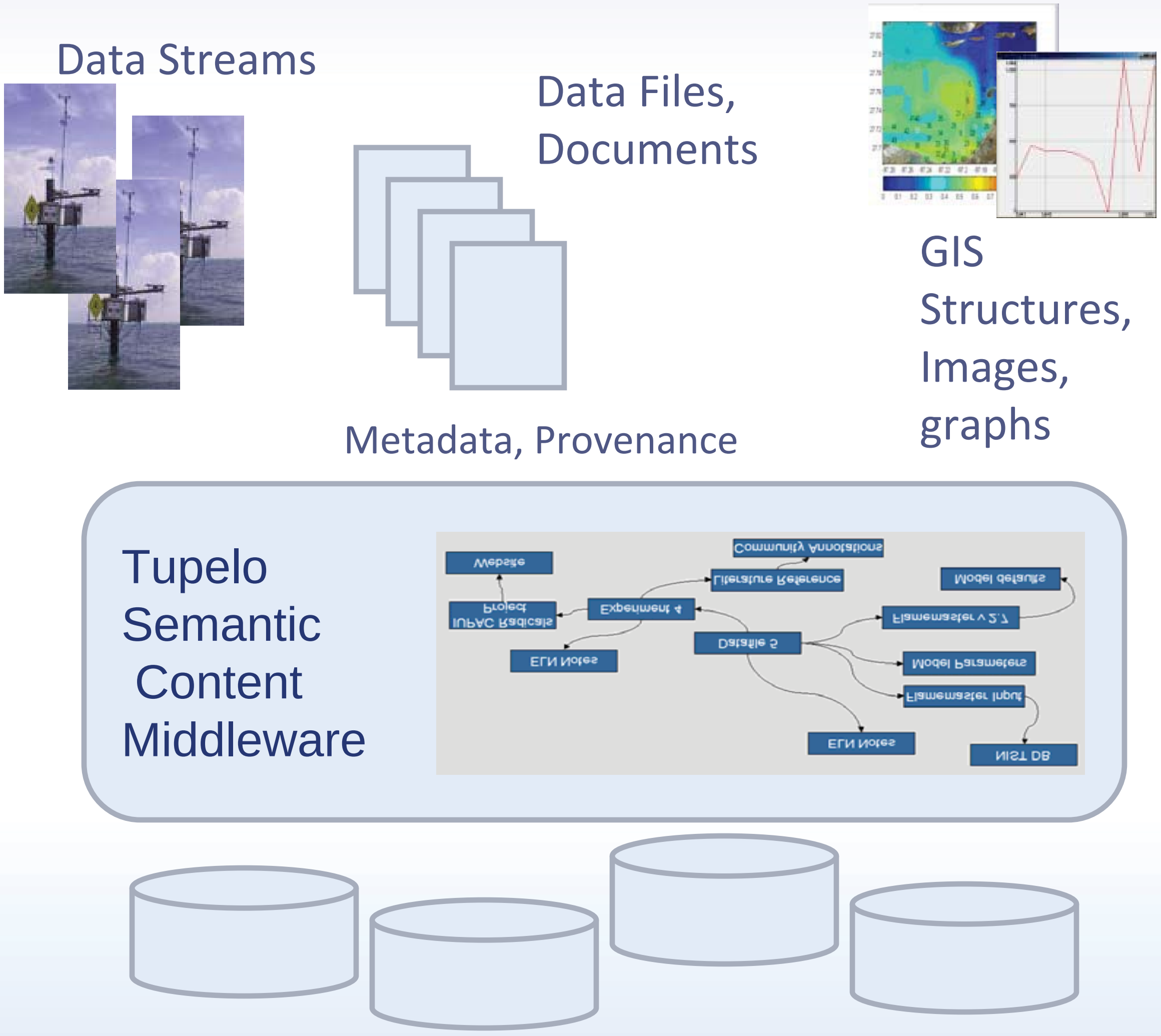
VM Farm / Compute Cloud



Desktop Exploration

Tupelo II: Semantic Content Management

- Web Protocol to
  - Authenticate
  - Get/Set Data
  - Get/Set Metadata
- Flexible Global Identifiers
- Extensions to support specific ontologies (provenance, data streams, GIS, …)



Data Streams

Data Files, Documents

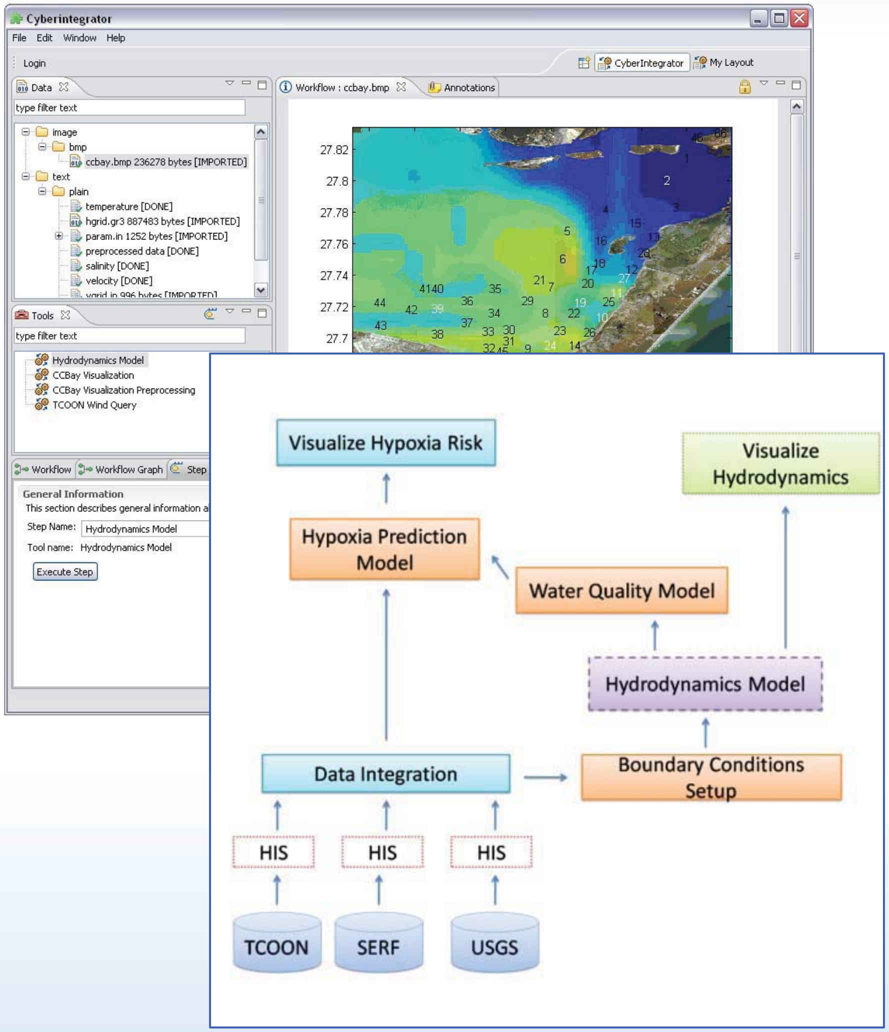
GIS Structures, Images, graphs

Metadata, Provenance

Tupelo Semantic Content Middleware

Local and Distributed Data Sources

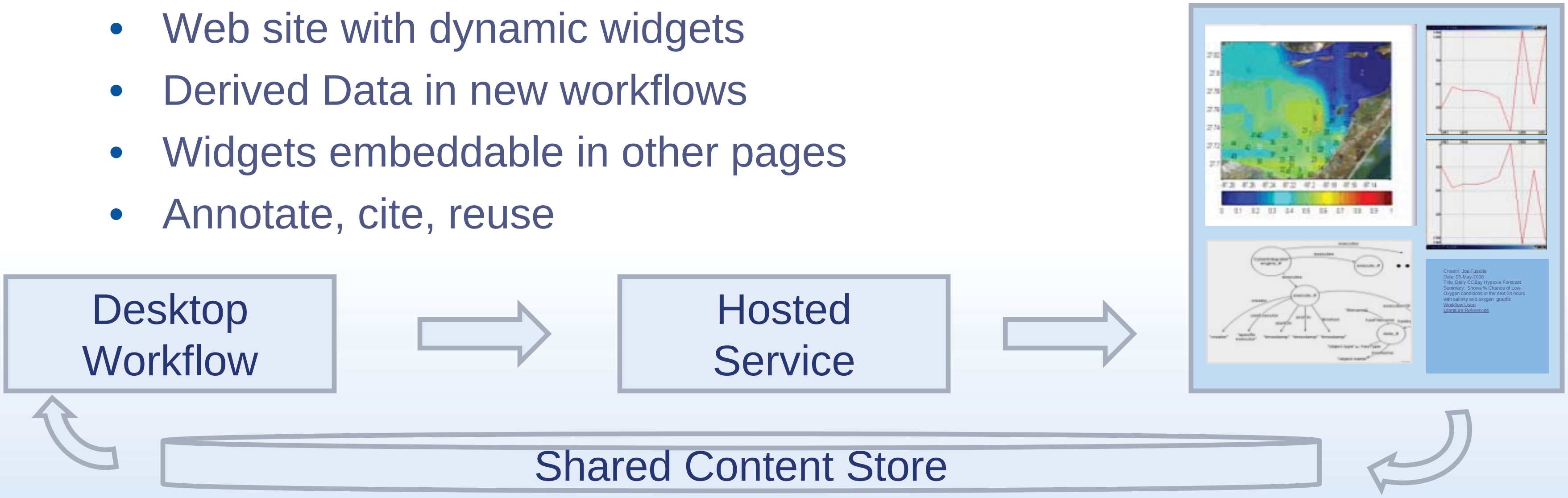
CyberIntegrator: Stream-aware Exploratory Workflow



- Identify Inputs
  - (e.g. temperature for the last 24 hours from sensors in a region)
- Link analyses and models
  - Could be Excel, Matlab, or high-end models
- Create/explore visualizations

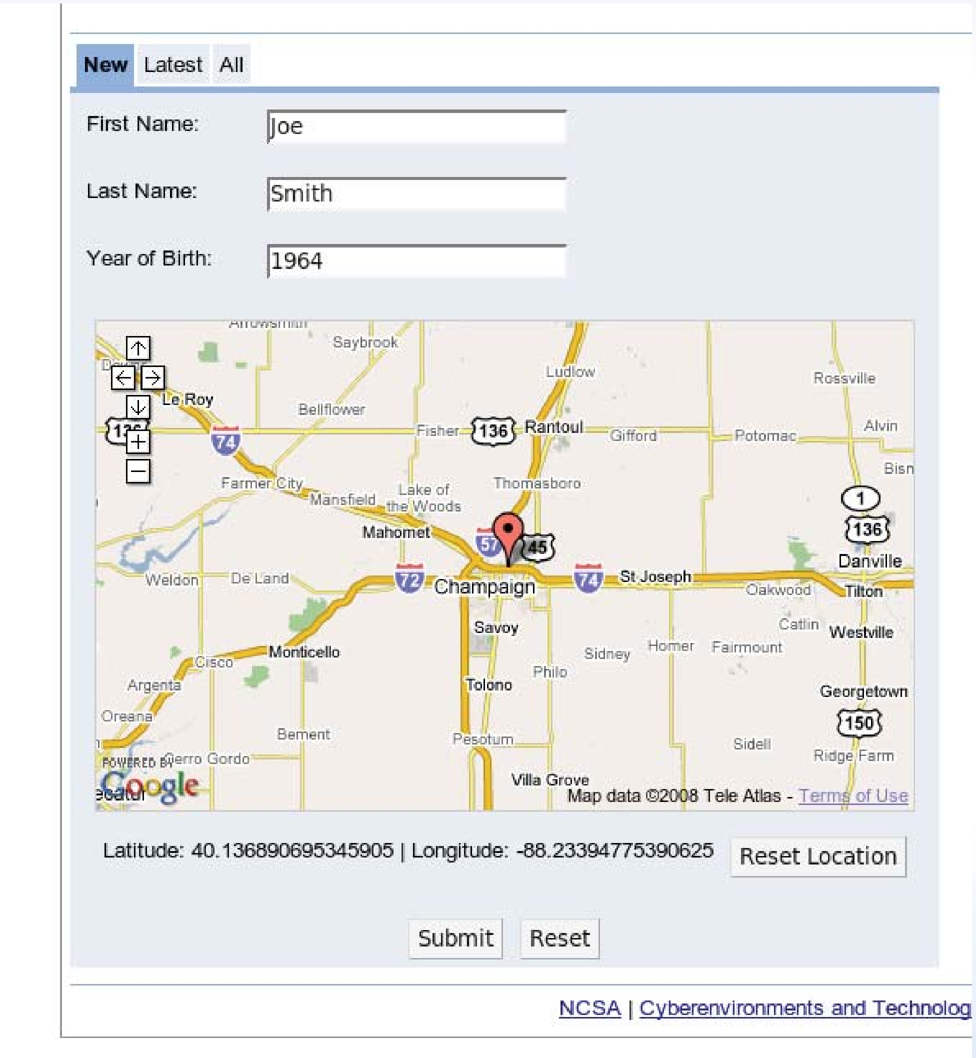
Web publication of data and models

- Select Data and Visualizations to Create/Display
- Select Model Inputs (If Any) to Expose
- Publish
  - Register workflow as a service
  - Verify Data/Models Available
  - Generate Input Page and Output Pages as Needed
- Use
  - Web site with dynamic widgets
  - Derived Data in new workflows
  - Widgets embeddable in other pages
  - Annotate, cite, reuse



Creator: Joe Futrelle
Date: 05-May-2008
Title: Daily CCBay Hypoxia Forecast
Summary: Shows % Chance of Low-Oxygen conditions in the next 24 hours with salinity and oxygen graphs
Workflow Used
Literature References

Historic Weather Data (e.g. on your Birthday)



First Name: Joe

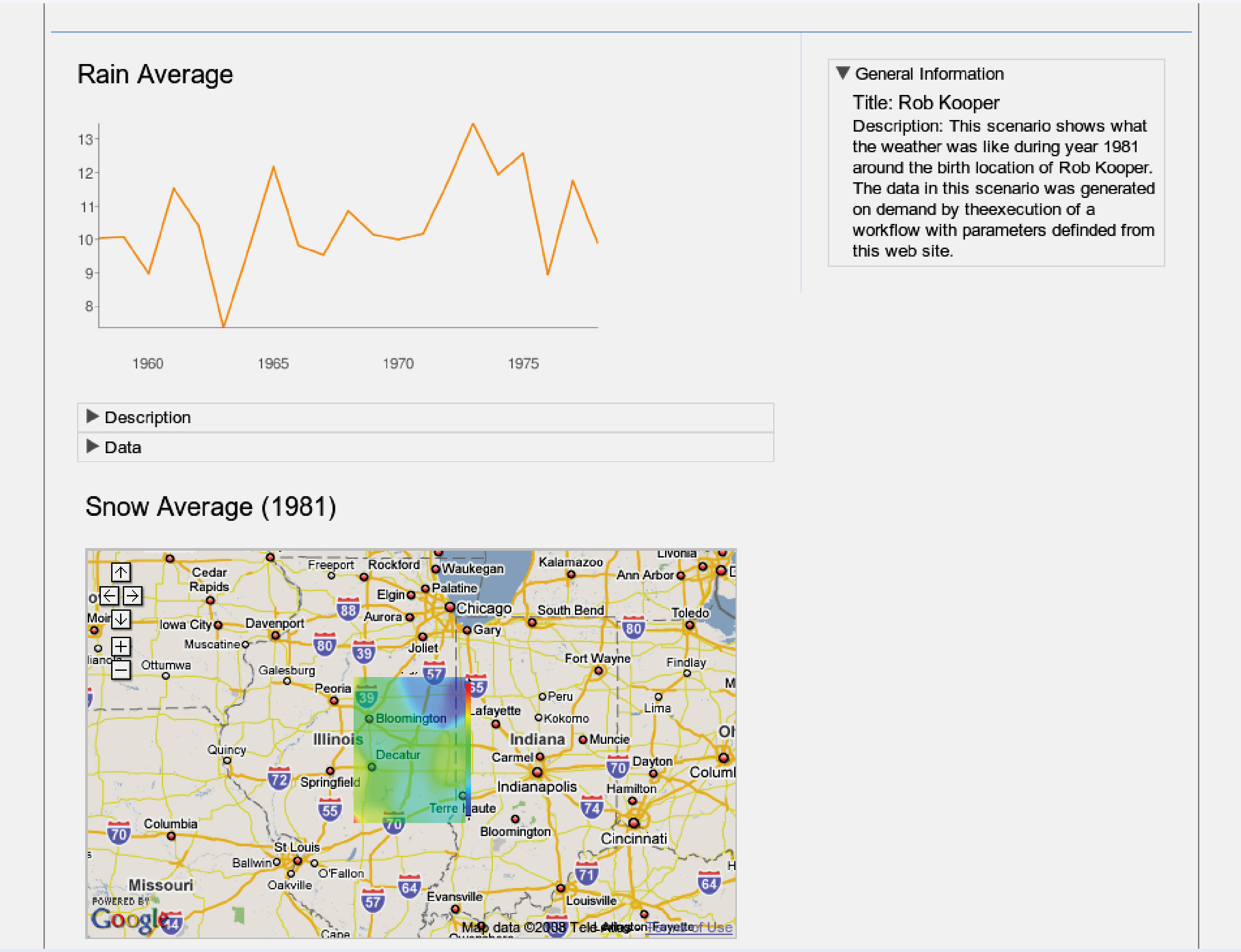
Last Name: Smith

Year of Birth: 1964

Latitude: 40.136890695345905 | Longitude: -88.23394775390625

NCSA | Cyberenvironments and Technolog

Historic Weather Data



Rain Average

▶ Description

▶ Data

Snow Average (1981)

▼ General Information

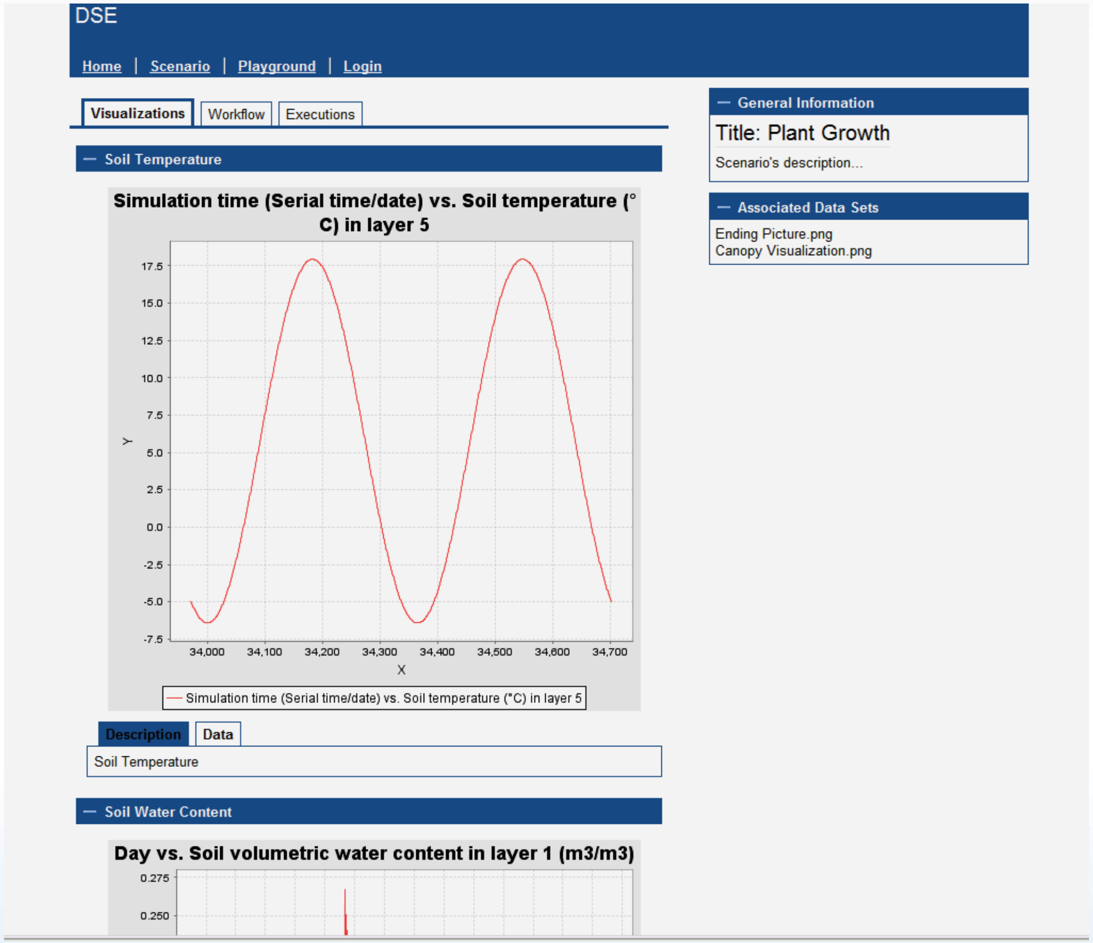
Title: Rob Kooper

Description: This scenario shows what the weather was like during year 1981 around the birth location of Rob Kooper. The data in this scenario was generated on demand by theexecution of a workflow with parameters definded from this web site.

Institute for Genomic Biology and 4-H:
Plant Growth Model

Making state-of-the-art plant growth models available for 4-H/student use

Integrating sophisticated modeling into “Seeds and Soils” 4-H activities



DSE
Home | Scenario | Playground | Login
Visualizations
Workflow
Executions
— Soil Temperature
Simulation time (Serial time/date) vs. Soil temperature (° C) in layer 5
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
-2.5
-5.0
-7.5
Y
34,000
34,100
34,200
34,300
34,400
34,500
34,600
34,700
X
Simulation time (Serial time/date) vs. Soil temperature (°C) in layer 5
Description
Data
— Soil Water Content
Day vs. Soil volumetric water content in layer 1 (m3/m3)
0.275
0.250
— General Information
— Associated Data Sets

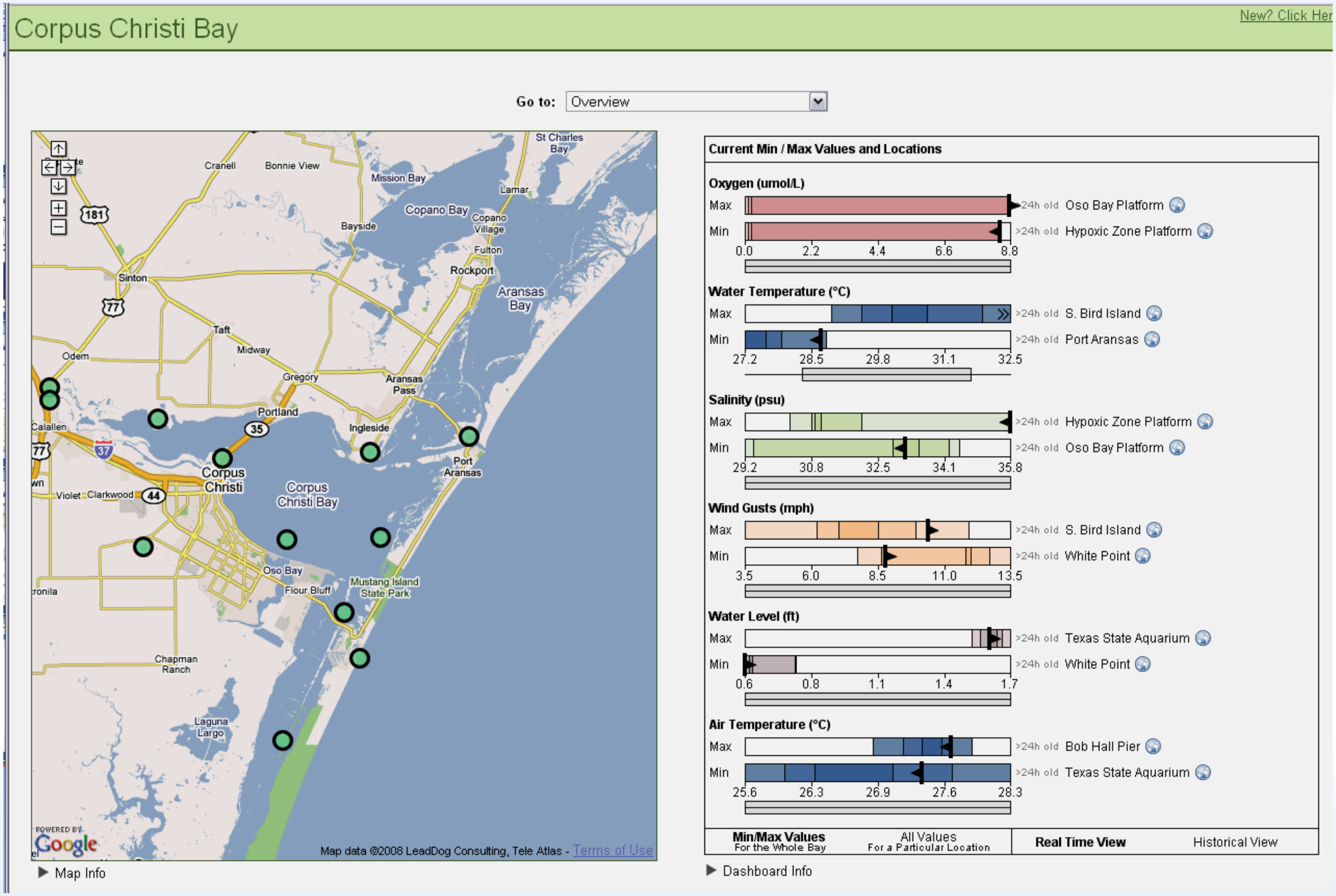
Soil Temperature

Title: Plant Growth

Scenario's description...

Ending Picture.png
Canopy Visualization.png

Corpus Christi Bay Dashboard



Corpus Christi Bay

New? Click Her

Go to: Overview

Map Info

Current Min / Max Values and Locations

Oxygen (umol/L)

Max >24h old Oso Bay Platform

Min >24h old Hypoxic Zone Platform

0.0 2.2 4.4 6.6 8.8

Water Temperature (°C)

Max >24h old S. Bird Island

Min >24h old Port Aransas

27.2 28.5 29.8 31.1 32.5

Salinity (psu)

Max >24h old Hypoxic Zone Platform

Min >24h old Oso Bay Platform

29.2 30.8 32.5 34.1 35.8

Wind Gusts (mph)

Max >24h old S. Bird Island

Min >24h old White Point

3.5 6.0 8.5 11.0 13.5

Water Level (ft)

Max >24h old Texas State Aquarium

Min >24h old White Point

0.6 0.8 1.1 1.4 1.7

Air Temperature (°C)

Max >24h old Bob Hall Pier

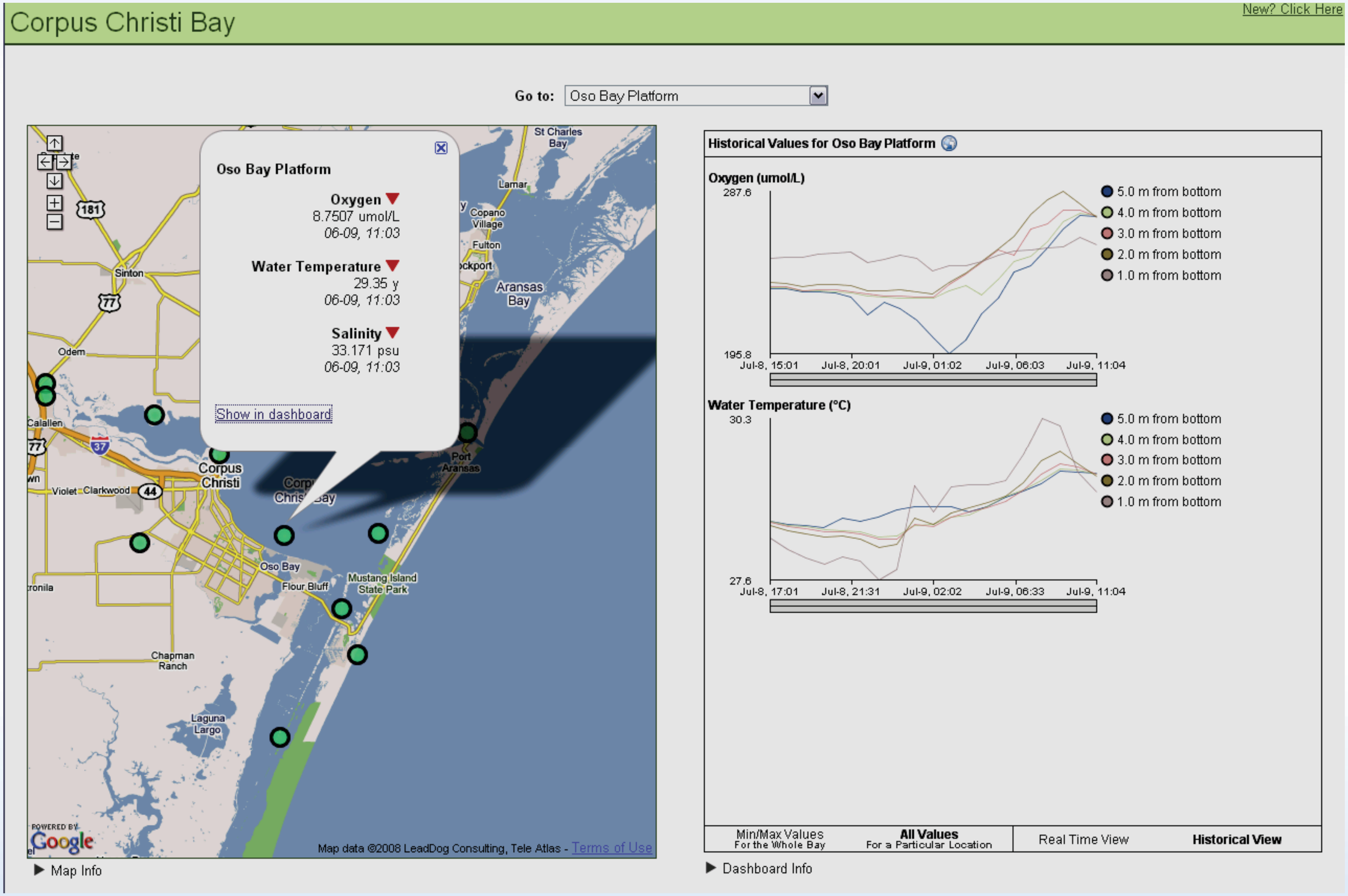
Min >24h old Texas State Aquarium

25.6 26.3 26.9 27.6 28.3

Min/Max Values For the Whole Bay | All Values For a Particular Location | **Real Time View** | Historical View

Dashboard Info

Corpus Christi Bay Dashboard



Corpus Christi Bay

New? Click Here

Go to: Oso Bay Platform

Oso Bay Platform

Oxygen ▼
8.7507 umol/L
06-09, 11:03

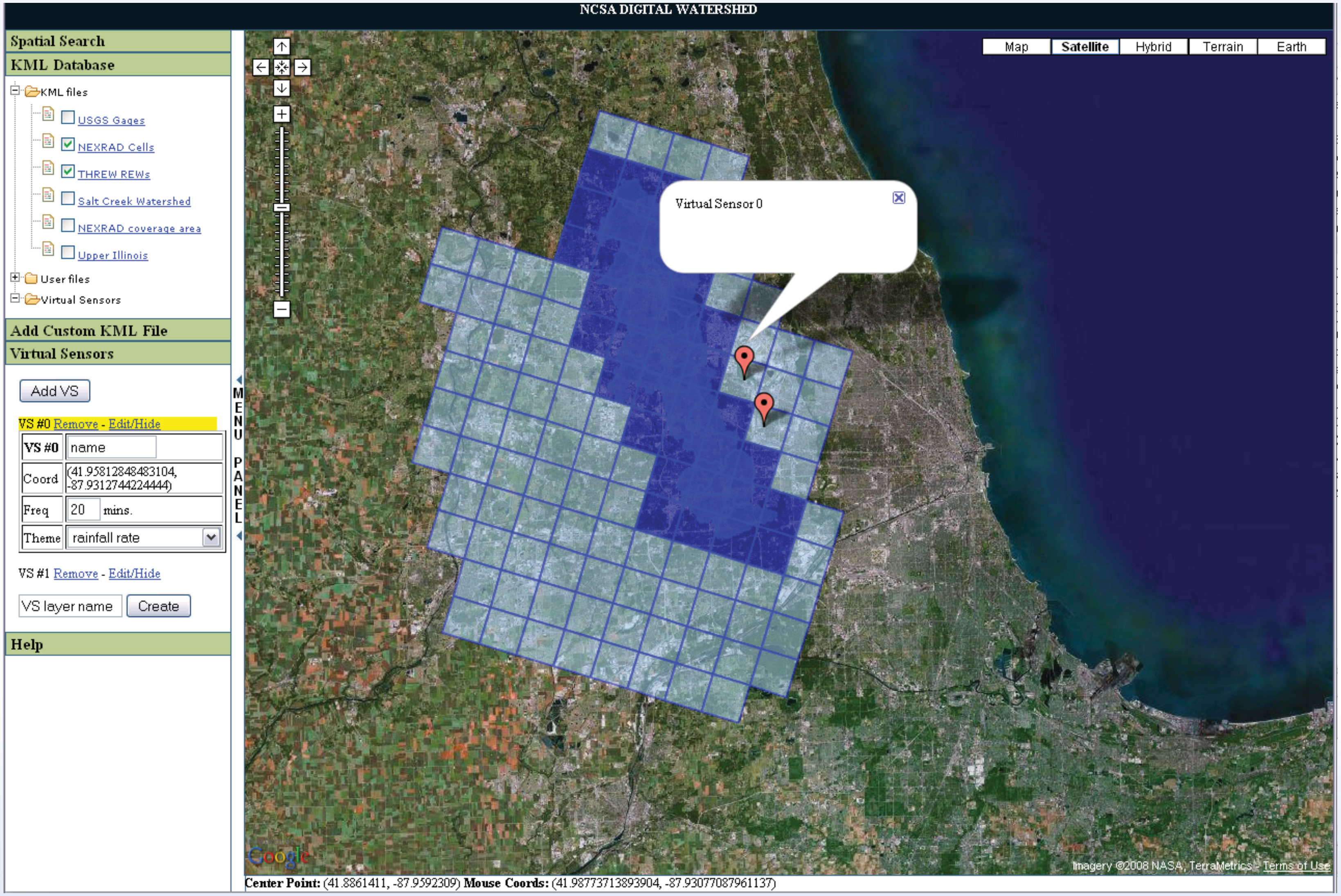
Water Temperature ▼
29.35 y
06-09, 11:03

Salinity ▼
33.171 psu
06-09, 11:03

Show in dashboard

Historical Values for Oso Bay Platform

Virtual Rain Gauges from Radar Reflectivity



VS #0 Remove - Edit/Hide

VS #0	name
Coord	(41.95812848483104, -87.9312744224444)
Freq	20 mins.
Theme	rainfall rate

VS #1 Remove - Edit/Hide

VS layer name Create

Center Point: (41.8861411, -87.9592309) **Mouse Coords:** (41.98773713893904, -87.93077087961137)

Impacts

- Mechanism to disseminate your data/model integrated with core Observatory data
- Adds Problem-Specific Capabilities to Observatory and a mechanism for continuing extension and evolution of Observatory services
- Publication allows users to convey expertise
  - (range of validity, ‘best’ values)
- Data and visualizations can be embedded in other sites
- System captures both data and processing for reuse
- Community Annotation of/ Interaction Around Problem Specific Virtual Observatory Interfaces

Conclusion

- Cyber Tools for Large Collaborations need to scale in ways that small project tools do not:
  - Edgeless
  - Evolving
  - Community customizable
  - Cost-effective
- There are design patterns that support such scaling
- Implementation of such tools breaks a ‘collaboration + data dissemination’ model and can provide significant new value to communities
- Inter-project coordination on interfaces and standards can help guide the CI community

Acknowledgments

NCSA CET Staff & Collaborators
WATERS Network & CI Communities

National Science Foundation
State of Illinois
Office of Naval Research
Department of Energy

… and Thank You

TRECC

Mid-America Earthquake Center

For more info, see
http://cet.ncsa.uiuc.edu/
http://cet.ncsa.uiuc.edu/publications/